

Last Revised: 2013-04-12 14:07:39.0

NI PCIe 6535B, 6536B, 6537B Datasheet



- 50 MHz maximum clock rate
- 200 MB/s maximum throughput
- 32 channels with per-channel directional control
- Selectable voltage levels of 2.5 and 3.3 V (5 V compatible)
- Synchronous and asynchronous timing modes
- Software compatible with NI 6533 and NI 6534 NI-DAQmx 9.6.1 or later applications

Overview

NI 6535B, NI 6536B, and NI 6537B digital I/O devices are high-speed 32-bit interfaces built on PCI Express bus technology. These cost-effective devices provide an ideal way to interface with a variety of digital applications requiring a high number of channels for digital I/O including high-speed functional digital tests, handshaking, chip testing, pattern generation, memory testing, and logic vector capture. This family features maximum clock rates of 10, 25, or 50 MHz; selectable voltage levels compatible with 2.5, 3.3, and 5 V TTL logic; and individually configured pins for input or output. With both synchronous and asynchronous timing modes, handshaking, and a software API designed around the NI-DAQmx (9.6.1 or later) driver, NI 6535B/36B/37B devices have the flexibility to meet the requirements of semiconductor, consumer electronics, and communications applications.

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Requirements and Compatibility

OS Information

- Windows 7
- Windows 7 64-bit
- Windows Server 2003 R2 32-bit
- Windows Server 2008 R2 64-bit
- Windows Vista
- Windows XP

Driver Information

- NI-DAQmx

Software Compatibility

- ANSI C
- LabVIEW
- LabVIEW Base Development System
- Measurement Studio
- Measurement Studio .NET Support
- Visual Studio
- Visual Studio .NET

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Application and Technology

Digital Interfacing

- Use NI 6535B/36B/37B devices to interface digital systems and devices directly with PC-based applications
- Control, communicate with, or send data to a digital device or system
- Analyze and record digital data
- Perform bidirectional communications with handshaking

Timing Modes

- Pattern I/O or sample clock (synchronous) – transfer patterns using an internal or external clock signal
- Burst handshaking (synchronous) – handshake an NI 6535B, NI 6536B, or NI 6537B device and the peripheral device during synchronous transfer to maximize the transfer rate
- Handshaking I/O (asynchronous) – transfer patterns when both the NI 6535B, NI 6536B, or NI 6537B device and the peripheral device are ready
- On-demand (unstrobed or static I/O) – acquire or generate data through software-timed commands
- Change detection – acquire data whenever a change occurs on one or more digital lines

High Signal Quality

NI 6535B/36B/37B devices feature an improved architecture, offering not only higher clock rates up to 50 MHz at low cost but also superior signal integrity and impedance matching.

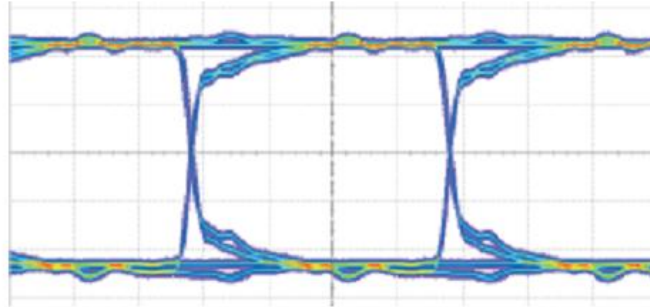


Figure 1. Eye Diagram of NI 6537B at 50 MHz

Improved Architecture Compatible with NI 6533 and NI 6534 Applications

These devices are ideal replacements for future-proofing applications currently using NI 6533/34 devices.

- NI 6535B/36B/37B devices are software-compatible with existing NI 6533/34 NI-DAQmx (9.6.1 or later) applications
- You can interface to existing NI 6533/34 fixtures and terminal blocks with the NI 653x cable adapter
- NI 6535B/36B/37B devices are compatible with most NI 6533/34 timing modes – pattern I/O, handshaking, change detection, and burst



Figure 2. You can use NI 6535B/36B/37B devices with an NI 653x cable adapter to connect to existing NI 6533/34 applications.

• In comparison to legacy digital I/O boards, NI 6535B/36B/37B devices have improved signal quality. In Figure 3, the top eye diagram is from an NI PCIe-6535B generating at 10 MHz. The bottom diagram shows an NI PCI-6534 generating a 10 MHz signal using signal termination recommended by NI.

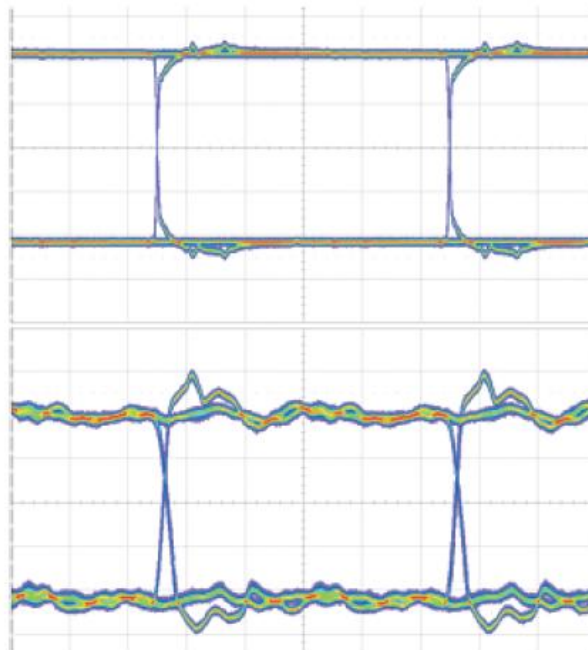


Figure 3. Eye Diagram Comparison of the NI 6535B (top) with the NI 6534 (bottom) Using Recommended Signal Termination

Connectivity Options

To meet connectivity requirements for high-speed digital applications, you can use NI 6535B/36B/37B devices with a variety of accessories.

- A CB-2162 connector block
- A 50 ½ shielded flying lead cable
- A VHDCI high-density connector

High-Speed Data Streaming

- Generate and acquire larger digital waveforms with PCI Express high-speed devices, using the ideal, low-cost NI 6535B/36B/37B devices
Stream continuously at up to 200 MB/s of data
- Stream data from the host computer's memory or high-end storage solution such as NI RAID arrays and controllers
- Use for applications requiring high speeds and fast streaming capabilities such as LCD testing, wireless protocols, ADC/DAC interfacing, or digital pattern capture
- Visit ni.com/streaming for more information

Multidevice Synchronization

These products use the PXI trigger bus or RTSI bus to send and receive clock and trigger signals to and from other NI 6535B/36B/37B devices in your system. With these capabilities, you can create synchronized systems with large numbers of digital I/O lines.

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Ordering Information

For a complete list of accessories, visit the product page on ni.com.

Products	Part Number	Recommended Accessories	Part Number
NI PCIe-6535B			
NI PCIe-6535B Requires: 1 Cable , 1 Connector Block	782629-01	Cable: Unshielded - C68-C68-D4 Cable (1m) <i>**Also Available: Shielded</i>	195949-01
		Connector Block: Not Applicable - Single-Ended CB-2162 Digital I/O Accessory	778592-01
NI PCIe-6537B			
NI PCIe-6537B Requires: 1 Cable , 1 Connector Block	782631-01	Cable: Unshielded - C68-C68-D4 Cable (1m) <i>**Also Available: Shielded</i>	195949-01
		Connector Block: Not Applicable - Single-Ended CB-2162 Digital I/O Accessory	778592-01
NI PCIe-6536B			
NI PCIe-6536B Requires: 1 Cable , 1 Connector Block	782630-01	Cable: Unshielded - C68-C68-D4 Cable (1m) <i>**Also Available: Shielded</i>	195949-01
		Connector Block: Not Applicable - Single-Ended CB-2162 Digital I/O Accessory	778592-01

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Support and Services

System Assurance Programs

NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at ni.com/advisor to find a system assurance program to meet your needs.

Calibration

NI measurement hardware is calibrated to ensure measurement accuracy and verify that the device meets its published specifications. To ensure the ongoing accuracy of your measurement hardware, NI offers basic or detailed recalibration service that provides ongoing ISO 9001 audit compliance and confidence in your measurements. To learn more about NI calibration services or to locate a qualified service center near you, contact your local sales office or visit ni.com/calibration.

Technical Support

Get answers to your technical questions using the following National Instruments resources.

- **Support** - Visit ni.com/support to access the NI KnowledgeBase, example programs, and tutorials or to contact our applications engineers who are located in NI sales offices around the world and speak the local language.
- **Discussion Forums** - Visit forums.ni.com for a diverse set of discussion boards on topics you care about.
- **Online Community** - Visit community.ni.com to find, contribute, or collaborate on customer-contributed technical content with users like you.

Repair

While you may never need your hardware repaired, NI understands that unexpected events may lead to necessary repairs. NI offers repair services performed by highly trained technicians who quickly return your device with the guarantee that it will perform to factory specifications. For more information, visit ni.com/repair.

Training and Certifications

The NI training and certification program delivers the fastest, most certain route to increased proficiency and productivity using NI software and hardware. Training builds the skills to more efficiently develop robust, maintainable applications, while certification validates your knowledge and ability.

- **Classroom training in cities worldwide** - the most comprehensive hands-on training taught by engineers.
- **On-site training at your facility** - an excellent option to train multiple employees at the same time.
- **Online instructor-led training** - lower-cost, remote training if classroom or on-site courses are not possible.
- **Course kits** - lowest-cost, self-paced training that you can use as reference guides.
- **Training memberships** and training credits - to buy now and schedule training later.

Visit ni.com/training for more information.

Extended Warranty

NI offers options for extending the standard product warranty to meet the life-cycle requirements of your project. In addition, because NI understands that your requirements may change, the extended warranty is flexible in length and easily renewed. For more information, visit ni.com/warranty.

OEM

NI offers design-in consulting and product integration assistance if you need NI products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Alliance

Our Professional Services Team is comprised of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 700 independent consultants and integrators. Services range from start-up assistance to turnkey system integration. Visit ni.com/alliance.

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